HUN 4813C

*Laboratory Techniques in Molecular Nutrition*

Spring 2020

**Lecture:** 2 Credits, Monday, Periods 2-3 (8:30-10:25 am) MAEB 234

**Laboratory:** 1 Credit, Wednesdays, Periods 2-4 (8:30-11:30 am) FSHN 310

**Instructor:** Robin da Silva
FSHN - Room 449
Tel: (352) 294-3751
Email: robindasilva@ufl.edu

**T/A:** Brandon Eudy

**Office Hours:** Monday and Wednesdays 2:00 – 4:00 pm

**Prerequisites:** CHM 2211, CHM 2211L

**Corequisites:** BCH 3025 or BCH 4024

**Description:**

Laboratory techniques relevant to the study of nutrition, ranging from biochemistry, molecular biology, genomics and bioinformatics.

**Course Learning Objectives:**

A main objective of this course is to introduce students to the theory, practice, and application of a variety of laboratory techniques that can be used to address and answer research questions in nutritional sciences. This course will cover both gold standard and cutting-edge research techniques in nutrition. Students will be challenged to apply their knowledge of nutrition to real research questions. After completing this course students should have a good knowledge of how common techniques are performed in nutritional science. Students will be able to fully comprehend scientific articles relevant to nutritional sciences, identify the components of experimental design and offer informed critique of findings in the literature.

- Demonstrate knowledge of biochemical analysis used in life sciences
- Identify limitations of research techniques
- Identify and understand study design and scientific models
- Refine laboratory skills and interpret results from techniques used in the lab
- Interpret and critique scientific articles
**Required Textbooks:** There is no required textbook for this course. Students will use relevant literature available through UF libraries (both physical and online).

**Recommended Materials:** There is a nominal materials fee associated with the lab component of this course. The fee will be in accordance with FSHN policy.

**Lectures and Laboratory (Subject to change)**

<table>
<thead>
<tr>
<th>Week</th>
<th>Date</th>
<th>Day</th>
<th>Topic</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>6-Jan</td>
<td>Mon (Lecture)</td>
<td>Introduction</td>
</tr>
<tr>
<td></td>
<td>8-Jan</td>
<td>Wed (No Lab)</td>
<td>No Lab</td>
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<tr>
<td>2</td>
<td>13-Jan</td>
<td>Mon (Lecture)</td>
<td>Study design and models</td>
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<td></td>
<td>15-Jan</td>
<td>Wed (No Lab*)</td>
<td>IRB training and Human Clinical Plan (Independent)</td>
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<td>3</td>
<td>20-Jan</td>
<td>Mon (HOLIDAY)</td>
<td>Martin Luther King Day</td>
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<td></td>
<td>22-Jan</td>
<td>Wed (Lab)</td>
<td>Pipetting</td>
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<td>4</td>
<td>27-Jan</td>
<td>Mon (Lecture)</td>
<td>Diet Studies</td>
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<td>29-Jan</td>
<td>Wed (Lab)</td>
<td>Total Protein determination</td>
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<td>5</td>
<td>3-Feb</td>
<td>Mon (Lecture)</td>
<td>Paper review (Posted on Canvas) and Quiz</td>
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<td>5-Feb</td>
<td>Wed (Lab)</td>
<td>Western blot</td>
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<td>6</td>
<td>10-Feb</td>
<td>Mon (Lecture)</td>
<td>Nutrient Metabolism and Proteins</td>
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<td>12-Feb</td>
<td>Wed (Lab)</td>
<td>Western blot</td>
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<td>7</td>
<td>17-Feb</td>
<td>Mon (Lecture)</td>
<td>Protein and antibodies</td>
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<td>19-Feb</td>
<td>Wed (Lab)</td>
<td>qPCR</td>
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<td>8</td>
<td>24-Feb</td>
<td>Mon (Exam)</td>
<td>Paper review (Posted on Canvas) and Quiz</td>
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<td>26-Feb</td>
<td>Wed (Presentation)</td>
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<td>9</td>
<td>2-Mar</td>
<td>Mon (Break)</td>
<td>No Class</td>
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<td>4-Mar</td>
<td>Wed (Break)</td>
<td>No Lab</td>
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<td>10</td>
<td>9-Mar</td>
<td>Mon (Lecture)</td>
<td>Metabolomics and Imaging</td>
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<td>11-Mar</td>
<td>Wed (Lab)</td>
<td>ELISA</td>
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<td>11</td>
<td>16-Mar</td>
<td>Mon (Discussion)</td>
<td>Energy Expenditure and Tracers</td>
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<td>18-Mar</td>
<td>Wed (Open)</td>
<td>ELISA</td>
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<tr>
<td>12</td>
<td>23-Mar</td>
<td>Mon (Discussion)</td>
<td>Paper review (Posted on Canvas) and Quiz</td>
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<td>25-Mar</td>
<td>Wed (Open)</td>
<td>Clinical trial (Mock)</td>
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<td>13</td>
<td>30-Mar</td>
<td>Mon (Discussion)</td>
<td>Presentations</td>
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<td>1-Apr</td>
<td>Wed (Lab)</td>
<td>Presentations</td>
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Critical Dates:
Classes Begin
Exam
Exam
Exam
Lab Assignments due
Presentations
Major Assignment due
Last day of Classes

THERE IS NO FINAL EXAM FOR THIS COURSE

Evaluation Scheme:

There will be three quizzes, one major written assignment, 2 laboratory assignments and a presentation in this course.

Presentations: Individuals or Groups of students (TBD) will select a peer-reviewed primary research article to present in class near the end of the semester. This must NOT be a review article or any other type of article than primary research. The article must utilize molecular techniques covered in class. You will use this article to complete the Major assignment as well.

Major written assignment: Each individual student will compose a research project proposal based on the article that they choose. The idea must incorporate molecular techniques; the assignment cannot be questionnaires or interviews etc. The proposal will be comprised of:
1) Introduction with background literature search and rationale for the project
2) Outline of the experimental plan that includes description of methods and techniques used
3) Description of the possible outcomes
4) Limitations
5) Future directions.

Limit of 5 pages not including references.
Laboratory assignments: There are TWO lab assignments. Each lab assignment should be written in the format of a primary research article. Similar to those that will be reviewed in class.

1. **Laboratory Assignment 1 (Molecular Analysis):** Students will write a summary of the molecular techniques that they performed in the labs. The assignment must include:

   1) Introduction
   2) Brief methods description
   3) Results
   4) Discussion (results and discussion can be discussed together)
   5) Example (give an example from peer reviewed literature that utilizes 2 of the techniques used in the labs and explain how they contributed to the papers conclusion)

   **Limit of 3 pages (you may use extra pages for figures and references only)**

2. **Laboratory Assignment 2 (Human Clinical):** Students will write a summary of their laboratory work on their human experiment. The assignment must include:

   1) Introduction
   2) Brief methods description
   3) Results
   4) Discussion (results and discussion can be discussed together)
   5) Design a test meal for Group 3 and discuss how it might influence the results

   **Limit of 3 pages (you may use extra pages for figures and references only)**

Quizzes 30%
Laboratory Assignments 20%
Presentation 20%
Major Assignment 30%

**UF Grading Policy:**

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<tr>
<th>Grade %</th>
<th>Letter Grade</th>
<th>GPA</th>
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<tbody>
<tr>
<td>93.4-100</td>
<td>A</td>
<td>4.00</td>
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<tr>
<td>90.0-93.3</td>
<td>A-</td>
<td>3.67</td>
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<tr>
<td>86.7-89.9</td>
<td>B+</td>
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<tr>
<td>83.4-86.6</td>
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<tr>
<td>80.0-83.3</td>
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<td>70.0-73.3</td>
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<td>66.7-69.9</td>
<td>D+</td>
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<td>63.4-66.6</td>
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Class and Laboratory Attendance:

Class and lab attendance and participation are mandatory in accordance with the University of Florida’s policy on attendance that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Students will behave in an appropriate manner in class, taking care not to disrupt other students learning activities. Students are asked to be punctual and submit assignments on time.

Online Course Evaluation Process:
Student assessment of instruction is an important part of efforts to improve teaching and learning. At the end of the semester, students are expected to provide feedback on the quality of instruction in this course using a standard set of university and college criteria. These evaluations are conducted online at https://evaluations.ufl.edu. Evaluations are typically open for students to complete during the last two or three weeks of the semester; students will be notified of the specific times when they are open. Summary results of these assessments are available to students at https://evaluations.ufl.edu/results.

Academic Honesty:
As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: “We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity.” You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."
It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: http://www.dso.ufl.edu/sccr/process/student-conduct-honor-code.

Software Use:
All faculty, staff and students of the university are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary
damages and/or criminal penalties for the individual violator. Because such violations are also against university policies and rules, disciplinary action will be taken as appropriate.

**Services for Students with Disabilities:**
The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues.

Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accommodation.

Rm 0001 Reid Hall, 352-392-8565, [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/)

**Campus Helping Resources:**
Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university’s counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575,
[www.counseling.ufl.edu/cwc/](http://www.counseling.ufl.edu/cwc/)
  Counseling Services
  Groups and Workshops
  Outreach and Consultation
  Self-Help Library
  Wellness Coaching

[Umatter We Care, www.umatter.ufl.edu/](http://www.umatter.ufl.edu/)
Career Resource Center, First Floor JWRU, 392-1601, [www.crc.ufl.edu/](http://www.crc.ufl.edu/)

**Student Complaints:**
The University of Florida believes strongly in the ability of students to express concerns regarding their experiences at the University. The University encourages its students who wish to file a written complaint to submit that complaint directly to the department that manages that policy. More information can be found here: